JOURNAL OF THEORETICAL BIOLOGY

Chief Editor: J. F. DANIELLI
Associate Editor: L. WOLPERT

Editorial Board

S. ARNOTT
E. A. BARNARD
J. BONNER
H. BREMERMANN
M. CALVIN
J. D. COWAN
N. GOEL
B. GOODWIN
S. KAUFFMAN
R. B. LUFTIG
H. M. MARTINEZ
R. M. MAY
J. MAYNARD SMITH
R. REIN
R. ROSEN
M. VOLKENSTEIN
A. WINFREE
M. YČAS
J. Z. YOUNG

VOLUME 67

July to August 1977

ACADEMIC PRESS

London New York San Francisco

Copyright © 1977, by Academic Press Inc. (London) Ltd

ALL RIGHTS RESERVED

No part of this volume may be reproduced in any form, by photostat, microfilm, or any other means, without written permission from the publishers.

Printed in Great Britain

Contents of Volume 67

Number 1, 7 July 1977

ODUTOLA, A. B., A Theoretical Consideration of a Model Simulating the Functional Organization of the Thoraco-lumbar Sympathetic Subsystem of the Spinal Cord 1

CHAPMAN, D. C., RAND, R. H. and COOKES, J. R., A Hydrodynamical Model of Bordered Pits in Conifer Tracheids 11

SITRAMAM, V. and RAO, N. J., Hierarchical Modelling of Acclimatory Processes 25

RAKITZIS, E. T., Kinetics of Irreversible Enzyme Inhibition: Co-operative Effects 49

KING-HELE, J. A. and PAULSON, R. W., On the Influence of a Leaky Tight Junction on Water and Solute Transport in Epithelia . 61

BARRICELLI, N. A., On the Origin and Evolution of the Genetic Code I. Wobbling and its Potential Significance 85

DELONG, R. and POPLIN, L., On the Etiology of Aging . . . 111

BARDSLEY, W. G., The Reduction in Degree of Allosteric and Other Complex Rate Equations Using Sylvester's Dialytic Method of Elimination 121

HINES, W. G. S., Competition with an Evolutionary Stable Strategy . 141

EPINOSA, M., GARCIA, E. and FERNAUD, J. M., Mathematical Approach to the Stimulation of the Competence Development in *Bacillus subtilis* 155

SOMOGYL, B., TRON, L. and DAMJANOVICH, S., Physical Analysis of the Molecular Motions during Transcription. 175

Number 2, 21 July 1977

GROVER, N. B., WOLDRINGH, C. L., ZARITSKY, A. and ROSENBERGER, R. F., Elongation of Rod-shaped Bacteria 181

OLIVER, S. G., On the Mutability of the Yeast Mitochondrial Genome 195

MADSEN, E. L., Theory for a Test of the Electric Cable Model of the Myelinated Axon and Saltatory Conduction 203

CONRAD, M., Principle of Superposition-free Memory . . . 213

HAY, G. A. and CHESTERS, M. S., A Model of Visual Threshold Detection 221

FERRARA, L., ANDINI, S. and TEMUSSI, P. A., Correlation between Prebiotic Amino Acid Compositions and Contemporary Proteins 241

FLETCHER, C. R., Electrical Potential Differences across Salt Transporting Membranes 255

VOGEL, R. I., Gingival Hyperplasia and Folic Acid Acid Deficiency from Anticonvulsive Drug Therapy: A Theoretical Relationship . 269

SPENCER, N. and CARTER, N., Amino Terminal Acetylation and the Levels of Some Erythrocyte Proteins 279

OSTROUMOV, S. A., Participation of Cholroplasts and Mitochondria in Virus Reproduction and the Evolution of the Eukaryotic Cell . 287

SRINIVASAN, R., BALASUBRAMANIAN, R. and RAKAN, S. S., Analysis of Protein Crystallographic Structural Data .II. Analysis of θ and δ Parameters on Some Proteins 299

WILLIAMS, J. D. and BOWEN, J. M., Intregal Correction of End-plate Potentials: A Useful Alternative to Peak Amplitude Correction . 313

BROSIO, E., CONTI, F., DI NOLA, A. and KOVACS, A. L., A Stereochemical Model for Phospholipids. I. Conformational Energy Refinement and Molecular Packing of L-α-Dipalmitoyl-lecithin (DPL) 319

LETTER TO THE EDITOR

BELLO, J., On the Free Energy of Mixing of Hydrophobic Side Chains in Protein 335

Number 3, 7 August 1977

YOCKEY, H. P., A Prescription which Predicts Functionally Equivalent Residues at Given Sites in Protein Sequences . . . 337

YOCKEY, H. P., On the Information Content of Cytochrome *c* . . 345

YOCKEY, H. P., A Calculation of the Probability of Spontaneous Biogenesis by Information Theory 377

BHARGAVA, S. C. and SAXENA, R. P., Stable Periodic Solutions of the Reactive-Diffusive Volterra System of Equations . . . 399

BARDSLEY, W. G., Factorability of the Allosteric Binding Polynomial and Graphical Manifestations of Co-operativity in Third Degree Saturation Functions 407

ENGASSER, J-M., FLAMM, M. and HORVIATH, C., Hormone Regulation of Cellular Metabolism: Interplay of Membrane Transport and Consecutive Enzymic Reaction 433

ADLER, I., An Application of the Contact Pressure Model of Phyllotaxis to the Close Packing of Spheres around a Cylinder in Biological Fine Structure 447

BASU, S., A Natural Source of Fluorescence Depolarization in Dye-DNA Complexes 459

PARKHURST, D. F., A Three-dimensional Model for CO_2 Uptake by Continuously Distributed Mesophyll in Leaves 471

LAKI, K., SEEL, M. and LADIK, J., Conformation of Triphosphate and Lysine Triphosphate Arginine Complex 489

MILES, D. L., MILES, D. W., REDINGTON, P. and EYRING, H., A Conformational Basis for the Selective Action of Ara-Adenine . . 499

ZAJICEK, G., The Intestinal Proliferon 515

BERG, O. G. and BLOMBERG, C., Mass Action Relations *in vivo* with Application to the *Lac* Operon 523

ANDERSON, R. G. W., The Biogenesis of Cell Structures and the Expression of Assembly Information 535

MACDONALD, N., Time Lag in a Model of a Biochemical Reaction Sequence with End Product Inhibition 549

HUANG, H. W., Thermodynamics of Allosteric Transitions . . 557

OOBATAKE, M. and OOI, T., An Analysis of Non-bonded Energy of Proteins 567

KIER, L. B., DI PAOLO, T. and HALL, L. H., Structure-Activity Studies on Odor Molecules using Molecular Connectivity . . . 585

LETTERS TO THE EDITOR

BLICK, J., Selection for Traits which Lower Individual Reproductions 597

ZAHAVI, A., The Cost of Honesty (Further Remarks on the Handicap Principle) 603

Number 4, 21 August 1977

KRISHNAN, L., KRISHNAN, E. C. and JEWELL, W. R., Theoretical Treatment of the Distribution and Degradation of Vascular, Interstitial and Intracellular Albumin 609

HUEMER, R. P., A Theory of Diagnosis for Orthomolecular Medicine . 625

BASS, L. and BRACKEN, A. J., Time-dependent Elimination of Substrates Flowing Through the Liver or Kidney 637

FISCHER, H. W., Improvement in Radiographic Contrast Media Through the Development of Colloidal or Particulate Media: an Analysis . 653

TROITSKY, N. A. and DROMASHKO, S. E., On the Question of the Recombination Frequencies of Proximal Markers in Bacterial Conjugation 671

GINZBURG, L. R., A Macro-equation of Natural Selection . . 677

ZEIGLER, B. P., Persistence and Patchiness of Predator-Prey Systems Induced by Discrete Event Population Exchange Mechanisms . 687

FEDUCCIA, A., Hypothetical Stages in the Evolution of Modern Ducks and Flamingos 715

KATZ, D. F. and PEDROTTI, L., Geotaxis by Motile Spermatozoa: Hydrodynamic Reorientation 723

THAMES, H. D., JR. and WHITE, R. A., State-vector Models of the Cell Cycle 1. Parametrization and Fits to Labeled Mitoses Data . . 733

LETTERS TO THE EDITOR

CIANCHI, L., MANCINI, M., SPINA, G. and CAPPELLETTI, R., On the Possibility of Deciding between Pauling's and Griffith's Models of Oxyhemoglobin by Means of Mossbauer Spectroscopy . 757

CIANCHI, L., MANCINI, M., SPINA, G. and CAPPELLETTI, R., On the Mossbauer Isomer Shift in Oxyhemoglobin . . . 765

MORGAN, R. S., Actin Rotates as Myosin Translates . . . 769

ORGEL, L. E., Gene-duplication and the Origin of Proteins with Novel Functions 773

Index to Volume 67

Acclimatory processes, hierarchical modelling of, 25
Actin rotates as myosin translates (letter), 769
ADLER, I., An application of the contact pressure model of phyllotaxis to the close packing of spheres around a cylinder in biological fine structure, 447
Aging, etiology of, 111
Albumen, theoretical treatment of the distribution and degradation of vascular interstitial and intracellular, 609
Allosteric transitions, thermodynamics of, 557
Amino acid compositions and contemporary proteins, correlation between prebiotic, 241
Amino terminal acetylation and the levels of some erythocyte proteins, 279
Analysis of non-bonded energy of proteins, 567
Analysis of protein crystallographic structural data II. Analysis of θ and δ parameters on some proteins, 299
ANDERSON, R. G. W., The biogenesis of cell structures and the expression of assembly information, 535
ANDRINI, S. (see FERŔARA, L.) 241
Application of the contact pressure model of phyllotaxis to the close packing of spheres around a cylinder in biological fine structure, 447
Ara-adenine, a conformational basis for the selective action of, 515

Bacteria, elongation of rod-shaped, 181
Bacterial conjugation, on the question of the recombination frequencies of proximal markers in, 671
BALASUBRAMANIAN, R. (see SRINIVASAN, R.), 299
BARDSLEY, W. G., The reduction in degree of allosteric and other complex rate equations using Sylvester's dialytic method of elimination, 121
BARRICELLI, N. A., On the origin and evolution of the genetic code I. Wobbling and its potential significance, 85
BRADSLEY, W. G., Factorability of the allosteric binding polynominal and graphical manifestations of co-operativity in third degree saturation functions, 407
BASS, L., and BRACKEN, A. J., Time dependent elimination of substrates flowing through the liver or kidney, 637
BASU, S. A natural source of fluorescence depolarization in dye-DNA complexes, 459
BELLO, J., on the free energy of mixing of hydropholic side chains in protein (letter), 335
BERG, O. G. and BLOMBERG, C., Mass action relations *in vivo* with applications to the *lac* operon, 523
BHARGAVA, S. C. and SAXENA, R. P., Stable periodic solutions of the reactive-diffusion volterra system of equations, 399
Biochemical reaction sequence with end product inhibition, time lag in a model of a, 549
Biogenesis by information theory, a calculation of the probability of spontaneous, 377
Biogenesis of cell structure and the expression of assembly information, 535

Biological fine structure, an application of the contact pressure model of phyllotaxis to the close packing of spheres around a cylinder in, 447
BLICK, J. Selection for traits which lower individual reproductions (letter), 597
BLOMBERG, C. (see BERG, O. G.), 523
Bordered pits in conifer tracheids, a hydrodynamical model, of 11
BOWEN, J. M. (see WILLIAMS, J. D.), 313
BRACKEN, A. J. (see BASS, L.), 637
BROSIO, E., CONTI, F., DI, NOLA, A. and KOVACS, A. L., A stereo-chemical model for phospholipids I. Conformational energy refinement and molecular packing of L-α-Dipalmitoyl-lecithin (DPL), 319

Calculation of the probability of spontaneous biogenesis by information theory, 377
CAPPELLETTI, R. (see CIANCHI, L.), 757
CAPPELLETTI, R. (see CIANCHI, L.), 765
CARTER, N. (see SPENCER, N.), 279
Cell cycle 1. Parametrization and fits to labeled mitoses data, state-vector models of the ,733
CHAPMAN, D. C., RAND, R. H. and COOKES, J. R., A hydrodynamical model of bordered pits in conifer tracheids, 11
CHESTERS, M. S. (see HAY, G. A.), 221
CIANCHI, L., MANCINI, M., SPINA, G. and CAPPELLETTI, R., On the possibility of deciding between Pauling's and Griffith's models of oxyhemoglobin by means of mossbauer spectroscopy (letter), 757
CIANCHI, L., MANCINI, M., SPINA, G. and CAPPELLETTI, R. on the Mossbauer isomer shift in oxyhemoglobin (letter), 765
Competence development in *Bacillus subtilis*, mathematical approach to the stimulation of the, 155
Competition with an evolutionary stable strategy, 141
Conformation of triphosphate and lysine triphosphate arginine complex, 489
Conformational basis for the selective action of ara-adenine, 499
CONRAD, M. Principle of superposition-free memory, 213
CONTI, F. (see BROSIO, E.), 319
COOKES, J. R. (see CHAPMAN, D. C.), 11
Correlation between prebiotic amino acid compositions and contemporary proteins, 241
Cost of honesty (Further remarks on the handicap principle) (letter), 603
Cytochrome *c*, information content of, 345

DAMJANOVICH, S. (see SOMOGYL, B.), 175
DELONG, R. and POPLIN, L., On the etiology of aging, 111
DI NOLA, A. (see BROSIO, E.), 319
DI PAOLA, T. (see KIER, L. B.), 585
DROMASHKO, S. E. (see TROITSKY, N. A.), 671
Dye-DNA complexes, a natural source of fluorescence depolarization in, 459

Electrical potential differences across salt transplanting membranes, 255
Elimination of substrates flowing through the liver or kidney, time dependent, 637

Elimination, the reduction in degree of allosteric and other complex rate equations using Sylvester's dialytic method of, 121
Elongation of rod-shaped bacteria, 181
End-plate potentials: A useful alternative to peak amplitude correction, integral correction of, 313
ENGASSER, J-M., FLAMM, M. and HORVIATH, C., Hormone regulation of cellular metabolism: Interplay of membrane transport and consecutive enzymic reactions, 433
Enzyme inhibition: Co-operative effects, kinetics of irreversible, 49
EPINOSA, M., GARCIA, E. and FERNAUD, J. M., Mathematical approach to the stimulation of the competence development in *Bacillus subtilis*, 155
Epithelia, on the influence of a leaky tight junction on water and solute transport in, 61
Erythrocyte proteins, amino terminal acetylation and the levels of some, 279
Eukaryotic cell, participation of chloroplasts and mitrochondria in virus reproduction and the evolution of the, 287
Etiology of aging, 111
Evolution of modern ducks and flamingos, hypothetical stages in the, 715
Evolutionary stable strategy, competition with, 141
EYRING, H. (see MILES, D. L.), 499

Factorability of the allosteric binding polynomial and graphical manifestations of co-operativity in third degree saturation functions, 407
FEDUCCIA, A., Hypothetical stages in the evolution of modern ducks and flamingos, 715
FERNAUD, J. M. (see EPINOSA, M.), 155
FERŔARA, L., ANDINI, S. and TEMUSSI, P. A., Correlation between prebiotic amino-acid compositions and contemporary proteins, 241
FISCHER, H. W., Improvement in radiographic contrast media through the development of colloidal or particulate media: an analysis, 653
FLAMM, M. (see ENGASSER, J-M.), 433
FLETCHER, C. R., Electrical potential differences across salt transporting membranes, 255
Free energy of mixing of hydrophobic side chains in protein (letter), 335

GARCIA, E. (see EPINOSA, M.), 155
Gene-duplication and the origin of proteins with novel functions (letter), 773
Genetic code I. Wobbling and its potential significance, on the origin and evolution of the, 85
Geotaxis by motile spermatozoa: Hydrodynamic reorientation, 723
Gingival hyperplasia and folic acid deficiency from anticonvulsive drug therapy: A theoretical relationship, 269
GINZBURG, L. R., A marco-equation of natural selection, 677
GROVER, N. B., WOLDRINGH, C. L., ZARITSKY, A. and ROSENBERGER, R. F., Elongation of rod-shaped bacteria, 181

HALL, L. H. (see KIER, L. B.), 585
HAY, G. A. and CHESTERS, M. S., A model of visual threshold detection, 221
Hierarchical modelling of acclimatory processes, 25

Hines, W. G. S., Competition with an evolutionary stable strategy, 141
Honesty (further remarks on the handicap principle), the cost of, 603
Hormone regulation of cellular metabolism: Interplay of membrane transport and consecutive enzymic reactions, 433
Horviath, C. (see Engasser J-M.), 433
Huang, H. W., Thermodynamics of allosteric transitions, 557
Huemer, R. P., A theory of diagnosis for orthomolecular medicine, 625
Hydrodynamical model of bordered pits in conifer tracheids, 11
Hydropholic side chains in protein, on the free energy mixing of (letter), 335
Hypothetical stages in the evolution of modern ducks and flamingos, 715
Improvement in radiographic contrast media through the development of colloidal or particulate media: an analysis, 653
Influence of a leaky tight junction on water and solute transport in epithelia, 61
Information content of cytochrome *c*, 345
Integral correction of end-plate potentials: A useful alternative to peak amplitude correction, 313
Intestinal proliferon, 515

Jewell, W. R. (see Krishnan, L.), 609

Katz, P. F. and Pedrotti, L., Geotaxis by motile spermatozoa: Hydrodynamic reorientation, 723
Kier, L. B., Di Paolo, T. and Hall, L. H., Structure-activity studies on odor molecules using molecular connectivity, 585
Kinetics of irreversible enzyme inhibition: Co-operative effects, 49
King-Hele, J. A. and Paulson, R. W., On the influence of a leaky tight junction on water and solute transport in epithelia, 61
Kovacs, A. L. (see Brosio, E.), 319
Krishnan, E. C. (see Krishnan, L.), 609
Krishnan, L., Krishnan, E. C. and Jewell, W. R., Theoretical treatment of the distribution and degradation of vascular, interstitial and intracellular albumin, 609

Laki, K., Seel, M. and Ladik, J., Conformation of triphosphate and lysine triphosphate arginine complex, 489
Ladik, J. (see Laki, K.), 489
Lac operon, mass action relations *in vivo* with applications to the, 523

MacDonald, N., Time lag in a model of a biochemical reaction sequence with end product inhibition, 549
Marco-equation of natural selection, 677
Madsen, E. L., Theory for a test of the electric cable model of the myelinated axon and saltatory conduction, 203
Mancini, M. (see Cianchi, L.), 757
Mancini, M. (see Cianachi, L.), 765
Mass action relations *in vivo* with application to the *lac* operon, 523
Mathematical approach to the stimulation of the competence development in *Bacillus subtilis*, 155
Membranes, electrical potential differences across salt transporting, 255
Memory, principle of superposition-free, 213

Mesophyll in leaves, a three-dimensional model for CO_2 uptake by continuously distributed, 471
Miles, D., L., Miles, D. W., Redington, P. and Eyring, H. A. conformational basis for the selective action of ara-adenine, 499
Miles, D. W. (see Miles, D. L.), 499
Mitochondria in virus reproduction and the evolution of the eukaryotic cell, participation of chloroplasts and, 287
Mitochondrial genome, on the mutability of the yeast, 195
Model of visual threshold detection, 221
Morgan, R. S., Actin rotates as myosin translates (letter), 769
Mossbauer isomer shifts in oxyhemoglobin (letter) 765
Mutability of the yeast mitochondrial genome, 195
Myelinated axon and saltatory conduction, theory for a test of the electric cable model of the, 203

Natural selection, a macro-equation of, 677
Natural source of fluorescence depolarization in dye-DNA complexes, 459

Odor molecules using molecular connectivity, structure-activity studies on, 585
Odutola, A. B., A theoretical consideration of a model simulating the functional organization of the thoraco-lumbar sympathetic subsystem of the spinal cord, 1
Oliver, S. G., On the mutability of the yeast mitochondrial genome, 195
Oobatake, M. and Ooi, T., An analysis of non-bonded energy of proteins, 567
Ooi, T. (see Oobatake, M.), 567
Orgel, L. E., Gene-duplication and the origin of proteins with novel functions (letter), 773
Origin and evolution of the genetic code I. Wobbling and its potential significance, 85
Orthomolecular medicine, a theory of diagnosis for, 625
Ostroumov, S. A., Participation of chloroplasts and mitochondria in virus reproduction and the evolution of the eukaryotic cell, 287
Oxyhemoglobin by means of Mossbauer spectroscopy, on the possibilty of deciding between Pauling's and Griffith's models of (letter), 757
Oxyhemoglobin, the Mossbauer isomer shift in (letter), 765

Parkhurst, D. F. A three dimensional model for CO_2 uptake by continuously distributed mesophyll in leaves, 471
Participation of chloroplasts and mitochondria in virus reproduction and the evolution of the eukaryotic cell, 287
Paulson, R. W. (see King-Hele, J. A.), 61
Pedrotti, L. (see Katz, D. F.), 723
Persistence and patchiness of predator-prey systems induced by discrete event population exchange mechanisms, 687
Phospholipids I. Conformational energy refinement and molecular packing of L-α-Dipalmitoyl-lecithin (DPL), a stereochemical model for, 319
Physical analysis of the molecular motions during transcription, 175
Poplin, L. (see Delong, R.), 111

Possibility of deciding between Pauling's and Griffith's models of oxyhemoglobin by means of Mossbauer spectroscopy (letter). 757
Predator-prey systems induced by discrete event population exchange mechanisms, persistence and patchiness, 687
Prescription which predicts functionally equivalent residues at given sites in protein sequences, 337
Principle of superposition-free memory, 213
Protein sequences, a prescription which predicts functionally equivalent residues at given sites in, 337
Proteins, analysis of non-bonded energy of, 567
Proteins with novel functions, gene-duplication and the origin of (letter), 773

Question of the recombination frequencies of proximal markers in bacterial conjugation, 671

Rakan, S. S. (see Srinivasan, R.), 299
Rand, R. H. (see Chapman, D. C.), 11
Rao, N. J. (see Sitramam, V.), 25
Rakitzis, E. T., Kinetics of irrreversible enzyme inhibition: Co-operative effects, 49
Redington, P. (see Miles, D. L.), 499
Reduction in degree of allosteric and other complex rate equations using Sylvester's dialytic method of elimination, 121
Reproductions, selection for traits which lower individual, 597
Rosenberger, R. F. (see Grover, N. B.), 181

Saxena, R. P. (see Bhargava, S. C.), 399
Seel, M. (see Laki, K.), 489
Selection for traits which lower individual reproductions (letter), 597
Sitramam, V. and Rao, N. J., Hierarchical modelling of acclimatory processes, 25
Somogyl, B., Tron, L. and Damjanovich, S., Physical analysis of the molecular motions during transcription, 175
Spencer, N. and Carter, N., Amino terminal acetylation and the levels of some erythrocyte proteins, 279
Spermatozoa: Hydrodynamic reorientation, geotaxis by motile, 723
Spina, G. (see Cianchi, L.), 757
Spina, G. (see Cianchi, L.), 765
Spinal cord, a theoretical consideration of a model simulating the functional organisation of the thoraco-lumbar sympathetic subsystem of the, 1
Srinivasan, R., Balasubramanian, R. and Rakan, S. S., Analysis of protein crystallographic structural data. II. Analysis of θ and δ parameter on some proteins 299
Stable periodic solutions of the reactive-diffusive volterra system of equations, 399
State-vector models of the cell cycle 1. Parametrization and fits to labeled mitoses data, 733
Stereochemical model for phospholipids I. Conformational energy refinement and molecular packing of L-α-dipalmitoyl-lecithin (DPL), 319
Structure activity studies on odor molecules using molecular connectivity, 585

TEMUSSI, P. A. (see FERRARA, L.) 241
THAMES, H. D., JR and WHITE, R. A., State-vector models of the cell cycle 1. Parametrization and fits to labeled mitoses data, 733
Theoretical consideration of a model simulating the functional organization of the thoraco–lumber sympathetic subsystem of the spinal cord, 1
Theoretical treatment of the distribution and degradation of vascular, interstitial and intracellular albumin, 609
Theory for a test of the electric cable model of the myelinated axon and saltatory conduction, 203
Theory of diagnosis for orthomolecular medicine, 625
Thermodynamics of allosteric transitions, 557
Thoraco-lumbar sympathetic subsystem of the spinal cord, a theoretical consideration of a model simulating the functional organization of the, 1
Three-dimensional model for CO_2 uptake by continuously distributed mesophyll in leaves, 471
Time lag in a model of a biochemical reaction sequence with end product inhibition, 549
Time dependent elimination of substrates flowing through the liver or kidney, 637
Tracheids, a hydrodynamical model of bordered pits in conifer, 11
Transcription, physical analysis of the molecular motions during, 175
Triphosphate and lysine triphosphate arginine complex, conformation of, 489
TROITSKY, N. A. and DROMASHKO, S. E., On the question of the recombination frequencies of proximal markers in bacterial conjugation, 671
TRON, L. (see SOMOGYL, B.), 175

Visual threshold detection, a model of, 221
VOGEL, R. I., Gingival hyperplasia and folic acid deficiency from anticonvulsive drug therapy: A theoretical relationship, 269
Volterra system of equations, stable periodic solutions of the reactive-diffusive, 399

WHITE, R. A. (see THAMES, H. D.), 733
WILLIAMS, J. D. and BOWEN, J. M., Integral correction of end-plate potentials: A useful alternative to peak amplitude correction, 313
WOLDRINGH, C. L. (see GROVER, N. B.), 181

YOCKEY, H. P., A prescription which predicts functionally equivalent residues at given sites in protein sequences, 337
YOCKEY, H. P., On the information content of cytochrome *c*, 345
YOCKEY, H. P., A calculation of the probability of spontaneous biogenesis by information theory, 377

ZAHAVI, A., The cost of honesty (Further remarks on the handicap principle), (letter), 603
ZAJICEK, G., The intestinal proliferon, 515
ZARITSKY, A. (see GROVER, N. B.), 181
ZEIGLER, B. P., Persistence and patchiness of predator-prey systems induced by discrete event population exchange mechanisms, 687